

Raymarine®



AIS700

Installation instructions

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Chapter 1: Important information

Product installation and operation

Ensure safe effective use of the product.

- This product must be installed and operated in accordance with the instructions provided. Failure to do so could result in personal injury, damage to your vessel and/or poor product performance.
- Raymarine® recommends certified installation by a Raymarine® approved installer. A certified installation qualifies for enhanced product warranty benefits. Contact your Raymarine® dealer for further details, and refer to the separate warranty document packed with your product.



Warning: Potential ignition source

This product is NOT approved for use in hazardous/flammable atmospheres. Do NOT install in a hazardous/flammable atmosphere (such as in an engine room or near fuel tanks).

Service and maintenance

This product contains no user serviceable components. Please refer all maintenance and repair to authorized Raymarine® dealers. Unauthorized repair may affect your warranty.

RF safety notice

RF radiation statement

AIS **transceivers** generate and radiate radio frequency (RF) electromagnetic energy (EME).

Compliance Statement (Part 15.19)

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

FCC Interference Statement (Part 15.105 (b))

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

1. Reorient or relocate the receiving antenna.
2. Increase the separation between the equipment and receiver.
3. Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
4. Consult the dealer or an experienced radio / TV technician for help.



Warning: FCC Warning (Part 15.21)

Changes or modifications to this equipment not expressly approved in writing by Raymarine Incorporated could violate compliance with FCC rules and void the user's authority to operate the equipment.

Industry Canada

This device complies with Industry Canada License-exempt RSS standard(s).

Operation is subject to the following two conditions:

1. This device may not cause interference; and
2. This device must accept any interference, including interference that may cause undesired operation of the device.

This Class B digital apparatus complies with Canadian ICES-003.

Industry Canada (Français)

Cet appareil est conforme aux normes d'exemption de licence RSS d'Industry Canada.

Son fonctionnement est soumis aux deux conditions suivantes:

1. cet appareil ne doit pas causer d'interférence, et
2. cet appareil doit accepter toute interférence, notamment les interférences qui peuvent affecter son fonctionnement.

Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.

Declaration of conformity

Raymarine® declares that this product is compliant with the essential requirements of Radio Equipment Directive 2014/53/EU.

AIS disclaimer

All information presented by the AIS700 is advisory only, as there is a risk of incomplete and erroneous information. By placing this product into service you acknowledge this and assume complete responsibility for any associated risks, and accordingly release Raymarine® and SRT Marine Systems plc from any and all claims arising from the use of the AIS service.

Disclaimer

Raymarine® does not warrant that this product is error-free or that it is compatible with products manufactured by any person or entity other than Raymarine®.

Raymarine® is not responsible for damages or injuries caused by your use or inability to use the product, by the interaction of the product with products manufactured by others, or by errors in information utilized by the product supplied by third parties.

Product disposal

Dispose of this product in accordance with the WEEE Directive.



■ The Waste Electrical and Electronic Equipment (WEEE) Directive requires the recycling of waste electrical and electronic equipment.

Warranty registration

Warranty registrations and associated benefits.

It is important that you register your product to receive full warranty benefits. Your unit package includes a bar code label indicating the serial number of the unit. You will need this serial number when registering your product online. You should retain the label for future reference.

Technical accuracy

Technical accuracy disclaimer

To the best of our knowledge, the information in this document was correct at the time it was produced. However, Raymarine® cannot accept liability for any inaccuracies or omissions it may contain. In addition, our policy of continuous product improvement may change specifications without notice. As a result, Raymarine® cannot accept liability for any differences between the product and this document.

Chapter 2: Document and product information

Chapter contents

- [2.1 Product documentation on page 12](#)
- [2.2 Applicable products on page 13](#)
- [2.3 Compatible displays on page 14](#)
- [2.4 Parts supplied on page 15](#)

2.1 Product documentation

The following documentation is applicable to your product:

Documentation

Description	Part number
AIS700 Installation instructions (This document) Installation of a AIS700 and connection to a wider system of marine electronics.	87326
GNSS antenna Mounting template Mounting diagram for the AIS700's GNSS receiver.	87225
LightHouse™ 3 Operation instructions Operation instructions for compatible LightHouse™ 3 displays.	81370
LightHouse™ 2 Operation instructions Operation instructions for compatible LightHouse™ 2 displays.	81360

2.2 Applicable products

This document is applicable to the following products:

Product number	Name	Description
E70476	AIS700	The AIS700 is a Class B AIS transceiver with a built-in VHF splitter, used to display real-time information on local vessels, land based stations or aids to navigation that are equipped with either Class A or Class B AIS transceivers.

Obtain MMSI (Maritime Mobile Service Identity) number

Before commencing installation ensure you have obtained a MMSI number for your vessel.

A MMSI is a 9 digit number which is sent over a radio frequency channel in order to identify the originating vessel/station. If your vessel already has a MMSI number (used for a VHF DSC radio) then the same MMSI number must be used to program your AIS700.

Note:

If a MMSI number is not entered, the AIS700 can only be used in Silent Mode and will operate as a receiver only.

In the United States of America, the MMSI and Static Data must be entered only by a Raymarine® dealer or other appropriately qualified installer of marine communications equipment on board vessels.

The user is NOT authorized to do this.

In some areas, a radio operator licence is required before a MMSI number will be issued. You can request a MMSI number from same agency that issues radio or Ship Radio licences in your area.

In Europe and other parts of the world outside of the United States of America, the MMSI and Static data can be set up by the user.

For further details, refer to the relevant Telecommunications Regulatory Body for your area.

Refer to [Appendix A MMSI Regulatory bodies and application submissions](#) for a list of contacts for obtaining MMSI numbers for some areas.



Warning: MMSI entry

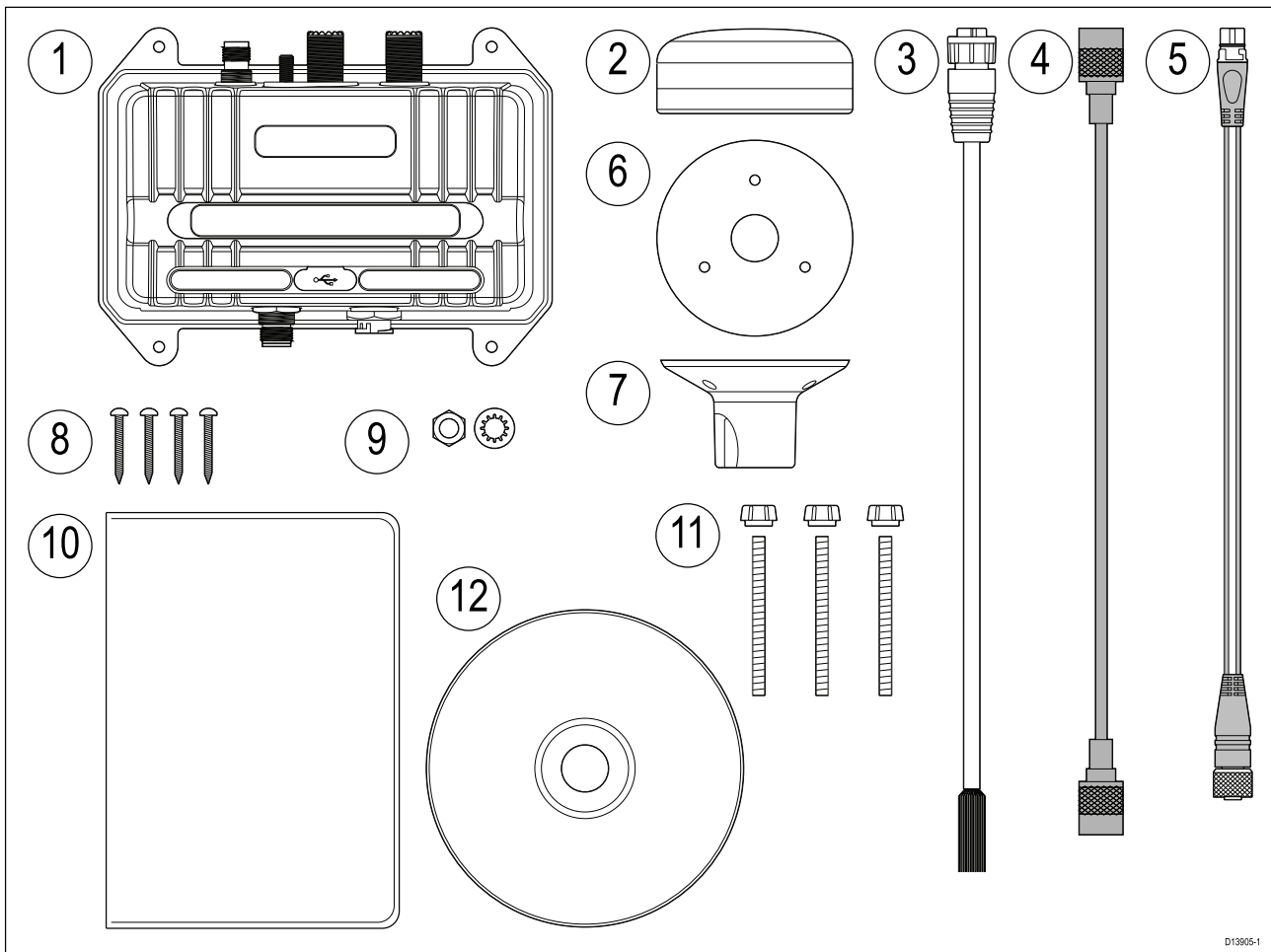
You can only enter a MMSI number once, if you enter the number incorrectly or need to change your MMSI number, the unit will require re-programming by an authorized Raymarine® dealer.

2.3 Compatible displays

You can view AIS information received by your AIS700 on a compatible display.

Your AIS700 is compatible with MFDs powered by the LightHouse™ 2 or LightHouse™ 3 operating system or multifunction instrument displays powered by the LightHouse™ operating system.

2.4 Parts supplied



1. AIS700
2. GNSS antenna
3. Power/data cable 2m (6.56 ft)
4. VHF Radio cable 1m (3.28 ft)
5. DeviceNet to SeaTalkng[®] adaptor cable 1m (3.28 ft)
6. GNSS antenna gasket
7. GNSS antenna pole mount
8. Unit fixings (4 x No.8x19 self tapping screws)
9. M5 nut and washer (grounding)
10. Documentation
11. GNSS antenna fixings (3 x M3x40 stud and thumb nut)
12. Software CD

Chapter 3: Installation

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- [3.1 Selecting a location on page 18](#)
- [3.2 Mounting the AIS700 on page 21](#)
- [3.3 Mounting the antenna on page 22](#)

3.1 Selecting a location



Warning: Potential ignition source

This product is NOT approved for use in hazardous/flammable atmospheres. Do NOT install in a hazardous/flammable atmosphere (such as in an engine room or near fuel tanks).

General location requirements

When selecting a location for your AIS700 it is important to consider a number of factors.

- **Water ingress** — The AIS700 should be mounted below decks. Although the AIS700 is waterproof, it is good practice to locate it in a protected area away from prolonged and direct exposure to rain and salt spray.
- **Ventilation** — To ensure adequate airflow:
 - Ensure that AIS700 is mounted in a compartment of suitable size.
 - Ensure that ventilation holes are not obstructed. Allow adequate separation of all equipment.
- **Electrical interference** — Select a location that is far enough away from devices that may cause interference, such as motors, generators and radio transmitters / receivers.
- **Power supply** — Select a location that is as close as possible to the vessel's DC power source. This will help to keep cable runs to a minimum.
- **Diagnostics** — The AIS700 must be mounted in a location where any diagnostics LEDs are easily visible.
- **Mounting surface** — Ensure the AIS700 is adequately supported on a secure surface. Do not mount units or cut holes in places which may damage the structure of the vessel.
- **Cabling** — Ensure the AIS700 is mounted in a location which allows proper routing, support and connection of cables:
 - Minimum bend radius of 100 mm (3.94 in) unless otherwise stated.
 - Use cable clips to prevent stress on connectors.
 - If your installation requires multiple ferrites to be added to a cable then additional cable clips should be used to ensure the extra weight of the cable is supported.

GNSS antenna location requirements

The AIS700 includes a built-in GNSS receiver and is supplied with a GNSS antenna which must be installed in accordance with the instructions provided. Do NOT connect any other GNSS antenna other than that supplied.

The GNSS antenna can be mounted either on a flat horizontal surface or on a suitable pole.

- If you intend to surface mount the antenna, ensure you have access to the underside of the mounting surface.
- If you intend to pole-mount the antenna, the pole needs to have a 1 inch 14 TPI thread.

Important:

The GNSS antenna must be mounted in a location that provides a good direct line of site to the entire sky, around the horizon.

Ensure that the selected mounting location is:

- Open and clear of any obstructions (such as masts, search lights, or other structures) that could block line-of-sight to the sky.
- As low as possible, to keep the antenna as stable as possible. The more stable the antenna, the more effectively it will track satellites and provide stable data.
- As far as possible (at least 1 m (3 ft)) from other antennae and electronic equipment.

Do NOT mount the antenna:

- In any area where it could be stepped on or tripped over.
- Up a mast. This will cause the antenna to swing and give significant errors in position data.
- In the direct path of a Radar beam.

EMC installation guidelines

Raymarine® equipment and accessories conform to the appropriate Electromagnetic Compatibility (EMC) regulations, to minimize electromagnetic interference between equipment and minimize the effect such interference could have on the performance of your system

Correct installation is required to ensure that EMC performance is not compromised.

Note:

In areas of extreme EMC interference, some slight interference may be noticed. Where this occurs the AIS700 and the source of the interference should be separated by a greater distance.

For **optimum** EMC performance we recommend that wherever possible:

- Raymarine® equipment and cables connected to it are:
 - At least 1 m (3 ft) from any equipment transmitting or cables carrying radio signals e.g. VHF radios, cables and antennas. In the case of SSB radios, the distance should be increased to 2 m (7 ft).
 - More than 2 m (7 ft) from the path of a Radar beam. A Radar beam can normally be assumed to spread 20 degrees above and below the radiating element.
- The AIS700 is supplied from a separate battery from that used for engine start. This is important to prevent erratic behavior and data loss which can occur if the engine start does not have a separate battery.
- Raymarine® specified cables are used.
- Cables are not cut or extended, unless doing so is detailed in the installation instructions.

Note: Where constraints on the installation prevent any of the above recommendations, always ensure the maximum possible separation between different items of electrical equipment, to provide the best conditions for EMC performance throughout the installation

Suppression ferrites

- Raymarine® cables may be pre-fitted or supplied with suppression ferrites. These are important for correct EMC performance. If ferrites are supplied separately to the cables (i.e. not pre-fitted), you must fit the supplied ferrites, using the supplied instructions.
- If a ferrite has to be removed for any purpose (e.g. installation or maintenance), it must be replaced in the original position before the product is used.
- Use only ferrites of the correct type, supplied by Raymarine® or its authorized dealers.
- Where an installation requires multiple ferrites to be added to a cable, additional cable clips should be used to prevent stress on the connectors due to the extra weight of the ferrites.

Connections to other equipment

Requirement for ferrites on non-Raymarine® cables.

If your AIS700 is to be connected to other equipment using a cable not supplied by Raymarine®, a suppression ferrite **MUST** always be attached to the end of the cable near the AIS700.

RF interference

Certain third-party external electrical equipment can cause Radio Frequency (RF) interference with GPS, AIS or VHF devices if the external equipment is not adequately insulated and emits excessive levels of electromagnetic interference (EMI).

Some common examples of such external equipment include LED spot or strip lights, and terrestrial TV tuners.

To minimize interference from such equipment:

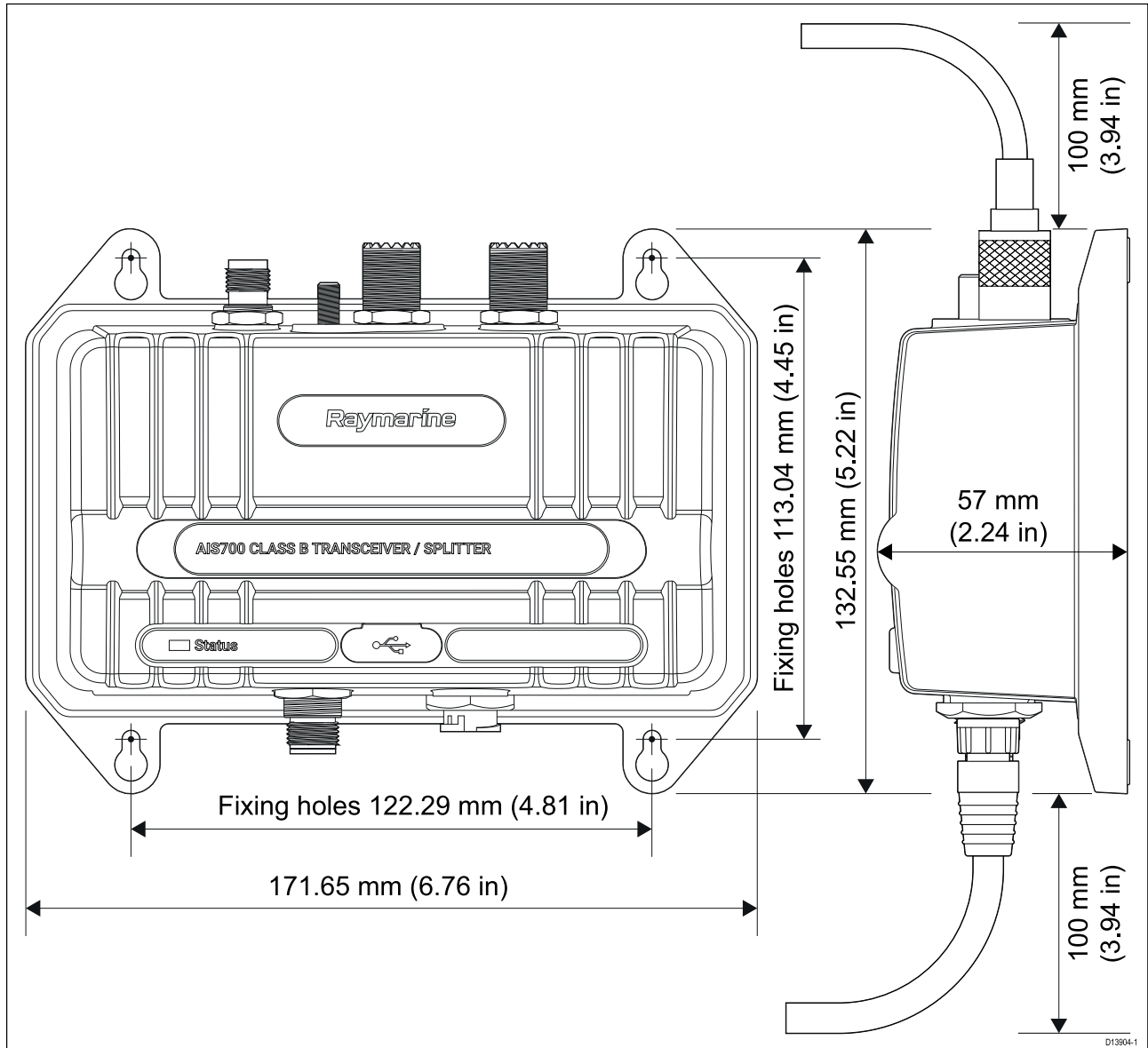
- Keep it as far away from GPS, AIS or VHF devices as possible.
- Ensure that any power cables for external equipment are not entangled with the power or data cables for GPS, AIS or VHF devices.
- Consider fitting one or more high frequency suppression ferrites to the EMI-emitting device. The ferrite(s) should be rated to be effective in the range 100 MHz to 2.5 GHz, and should be fitted to the power cable and any other cables exiting the EMI-emitting device, as close as possible to the position where the cable exits the device.

Compass safe distance

To prevent potential interference with the vessel's magnetic compasses, ensure an adequate distance is maintained from the AIS700.

When choosing a suitable location for the AIS700 you should aim to maintain the maximum possible distance from any compasses. Typically this distance should be at least 1 m (3 ft) in all directions. However for some smaller vessels it may not be possible to locate the AIS700 this far away from a compass. In this situation, when choosing the installation location, ensure that the compass is not affected by the AIS700 when it is in a powered state.

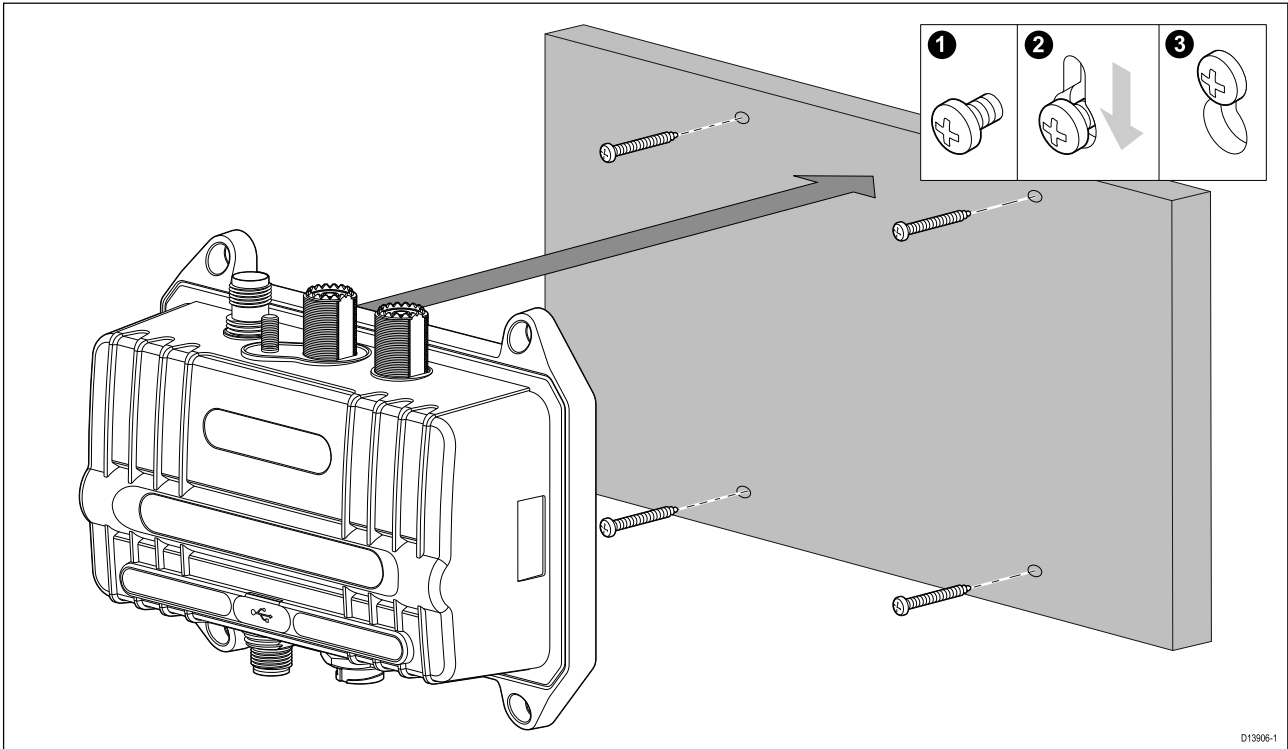
AIS700 dimensions



3.2 Mounting the AIS700

Before mounting the AIS700 ensure that you have:

- selected a suitable location (a clear, flat surface is required).
- Identified the relevant cable connections and the route that the cable will take.



1. Using the AIS700 as a guide, mark the location of the mounting holes on the mounting surface.
2. Drill holes for the mounting fixings using a drill with a suitable sized drill bit.
3. Screw the fixings approximately half way into the holes in the mounting surface.
4. Place the AIS700 over the fixings screws and push down to lock into position.
5. Fully tighten the screws.
6. Connect the necessary cables.

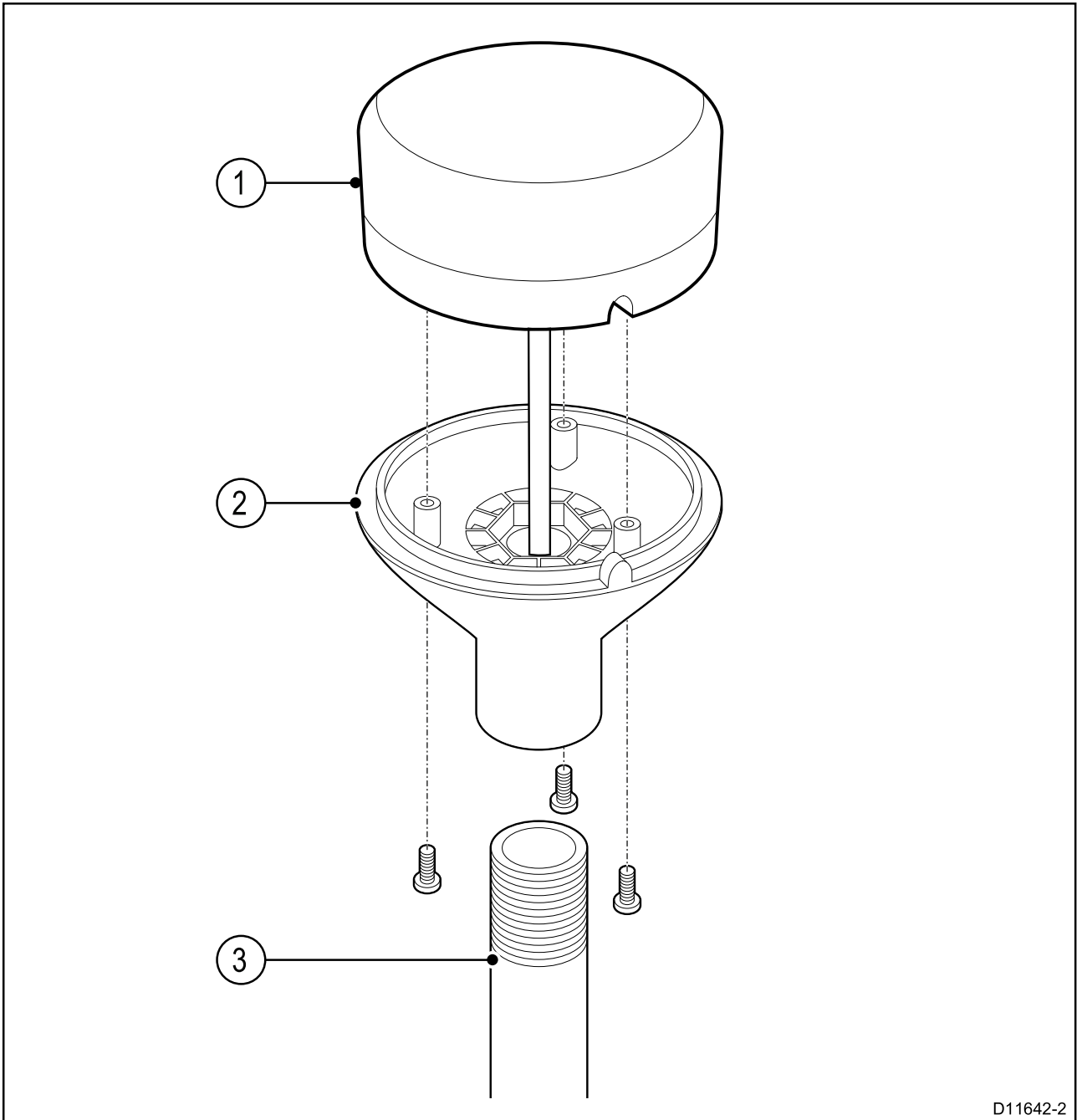
3.3 Mounting the antenna

To mount the antenna:

1. Select a suitable location for the antenna, as described in the *GNSS antenna location requirements* section.
2. Mount your antenna using either the *Surface mounting* or *Pole mounting* procedure, as appropriate.

Pole mounting

If you want to pole-mount the antenna, obtain a pole of suitable length with a 1 inch 14 TPI thread.



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1	GNSS antenna
2	Pole mount adaptor
3	Mounting pole (not supplied)

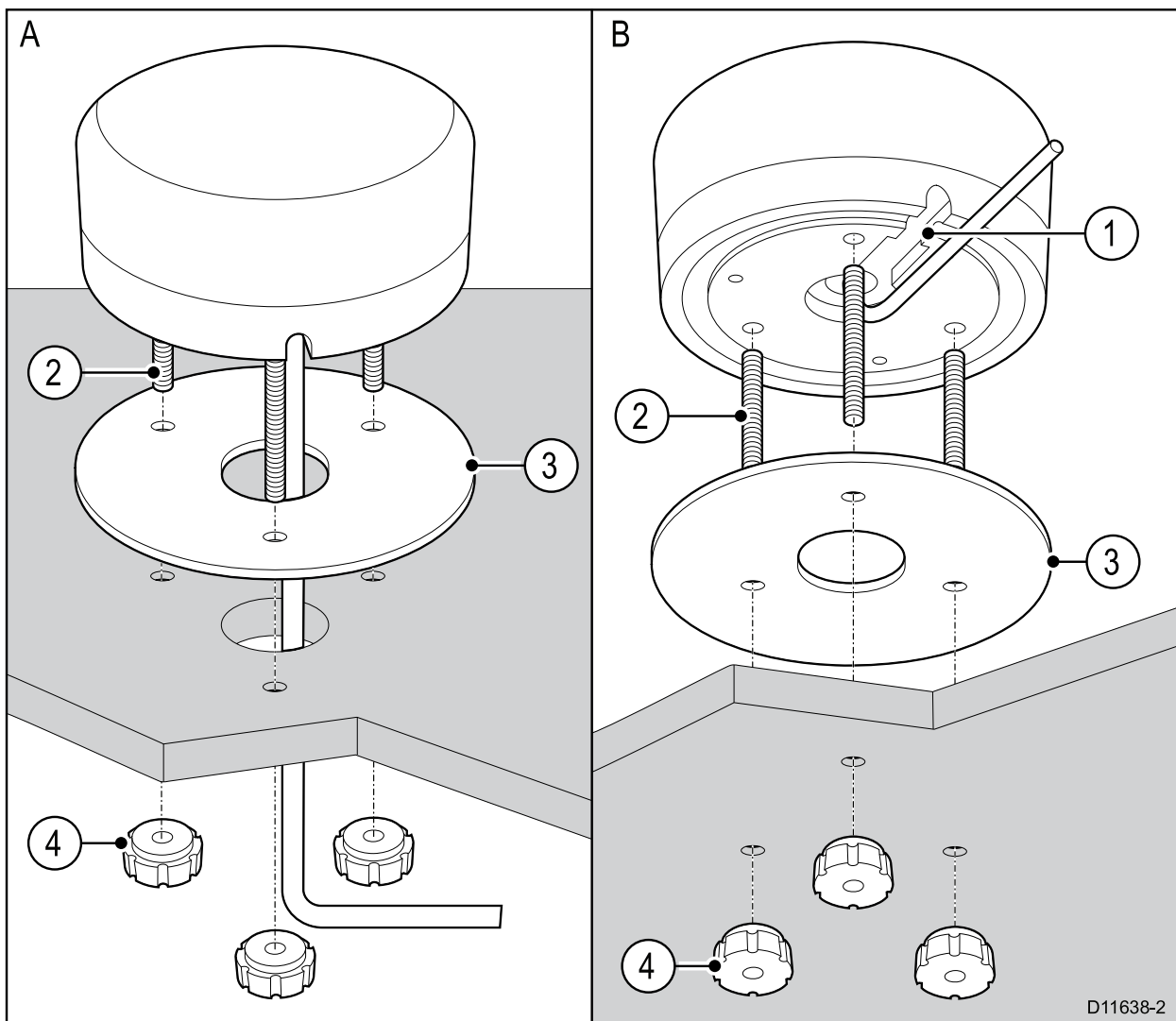
1. Ensuring that the *GNSS antenna location requirements* are met, securely attach the pole to a suitable, secure point.
2. Remove and retain the screws securing the antenna to the pole mount adaptor, then separate these two items.

3. Screw the pole mount adaptor fully onto the pole and ensure it is secure.
4. Feed the antenna cable through the center of the pole mount adaptor and then down through the center of the mounting pole.
5. Ensuring you do not trap the cable, place the antenna on the pole mount adaptor so the screw holes are aligned, then secure the antenna with the 3 screws removed during step 2.

Surface mounting

When surface mounting the antenna, you can route the cable either centrally (Option A) or from the side of the antenna (Option B).

1. Remove the 3 screws securing the antenna to its pole mount adaptor, then remove the adaptor from the antenna.
2. Using the supplied mounting template, mark and drill the mounting holes.
 - OPTION A: If the cable is going to pass through the mounting surface, drill a 19 mm (0.75 in.) center hole for the cable.
 - OPTION B: If the cable is to be routed from the side of the antenna (i.e. above the mounting surface), remove the piece of plastic covering the end of the cable channel and route the cable through the channel (1). Incorrect cable routing can cause damage to the cable.



3. Screw the supplied mounting studs (2) into the underside of the antenna.
4. Stick the supplied gasket (3) to the mounting surface, ensuring that the holes on the gasket correspond with the drilled holes.
5. Route the cable as follows:
 - For Option A, feed the cable down through the center hole.
 - For Option B, route the cable along the cable channel.
6. Carefully place the antenna so the mounting studs pass through the holes in the mounting surface.
7. Secure the antenna to the surface using the supplied thumb nuts (4).

Note:

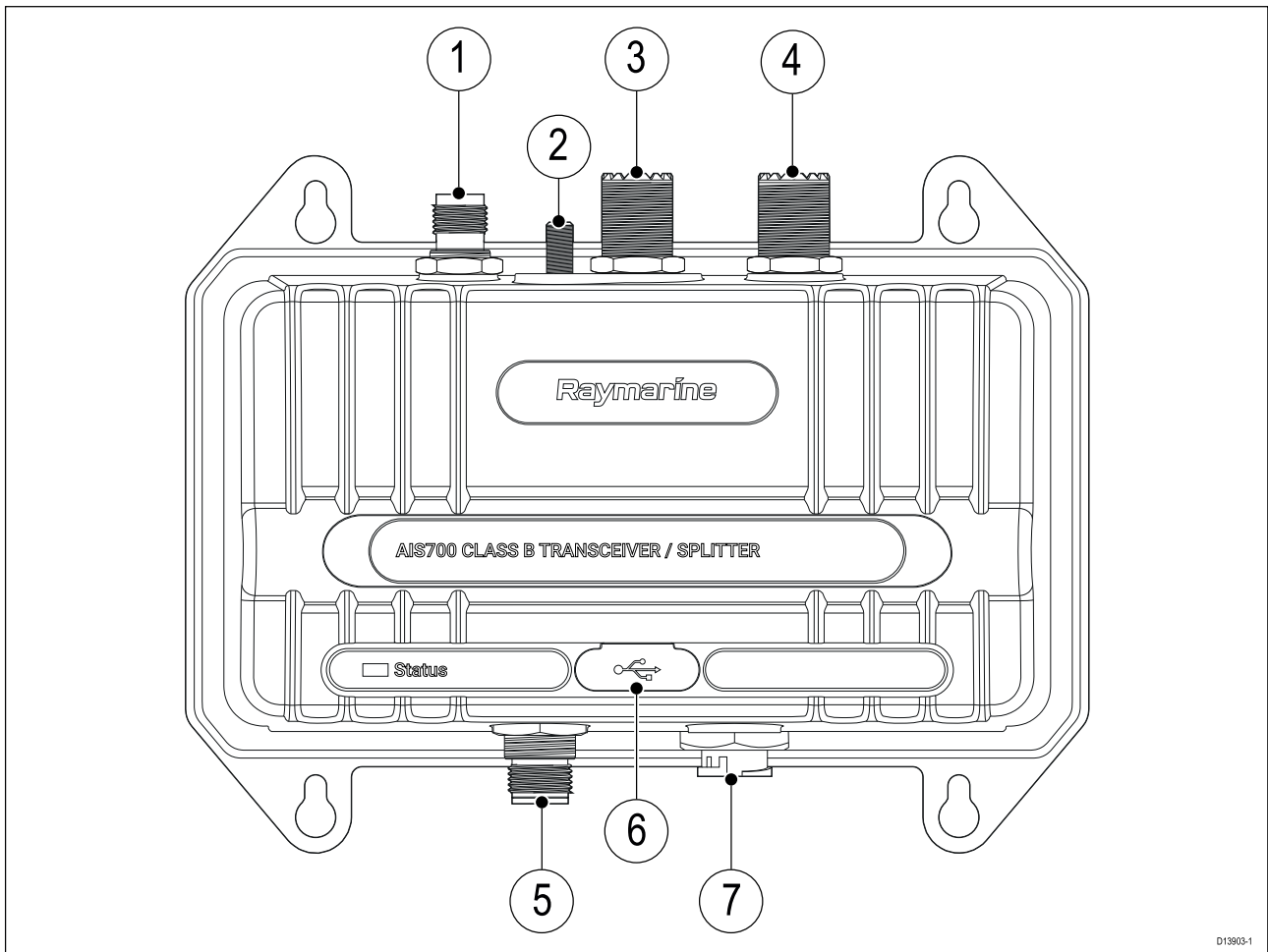
- The thumb nuts supplied with your product may differ slightly from those shown in the illustration.
- Only use the studs and thumb nuts supplied with the antenna.

Chapter 4: Connections

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- [4.1 Connections overview on page 26](#)
- [4.2 USB connection on page 27](#)
- [4.3 Power connection on page 29](#)
- [4.4 NMEA 2000 / SeaTalkng[®] connection on page 33](#)
- [4.5 NMEA 0183 connection on page 34](#)
- [4.6 GPS \(GNSS\) antenna connection on page 35](#)
- [4.7 VHF antenna connection on page 36](#)
- [4.8 VHF radio connection on page 37](#)
- [4.9 Silent mode switch connection on page 38](#)

4.1 Connections overview



D13903-1

	Connection	Connects to:	Suitable cables:
1	GNSS connection	GNSS antenna	GNSS antenna's fitted cable
2	Grounding earth stud connection	Vessel RF ground only	Refer to the Grounding section.
3	To Antenna connection	VHF antenna	VHF antenna cable
4	To VHF connection	VHF Radio	The supplied VHF radio cable
5	NMEA 2000 / SeaTalkng [®] connection	NMEA 2000 or SeaTalkng [®] backbone.	The supplied DeviceNet to SeaTalkng [®] adaptor cable or a DeviceNet spur cable
6	USB connection	Personal computer (PC)	Micro B USB cable
7	Power and data connection	<ul style="list-style-type: none"> • 12/24 V dc power supply • NMEA 0183 devices • Silent mode switch 	The supplied Power/data cable

Data connections matrix

The following table details the types of data that can be exchanged using the various combinations of data connections NMEA 0183 (Low / High baud rate), NMEA 2000 / SeaTalkng®, and USB).

It is important to choose the right combination of connections in order to exchange the types of data you require.

As an example of how to use the table below, you can see that you can feed GNSS data into the AIS700 via a NMEA 0183 port configured for low baud rate (4,800), and then output it along with AIS data to the other NMEA 0183 port configured for high baud rate (38,400).

When data is input on one NMEA 0183 port it is output on the other NMEA 0183 port, you cannot receive and send data on the same NMEA 0183 port.

INPUTS	OUTPUTS							
	NMEA 0183 (4,800)		NMEA 0183 (38,400)		NMEA 2000,* / SeaTalkng®		USB	
	GNSS	AIS	GNSS	AIS	GNSS	AIS	GNSS	AIS
NMEA 0183 (4,800) GNSS	✗	✗	✓	✓	✗	✓	✗	✗
NMEA 0183 (38,400) GNSS	✓	✗	✗	✗	✗	✓	✗	✗
NMEA 2000 / SeaTalkng® GNSS	✗	✗	✗	✓	✗	✓	✗	✓

Important:

To avoid potential data conflicts or loops multiple network protocols should not be connected to the same device i.e.:

- Do NOT connect the AIS700 to a MFD using NMEA 0183 and SeaTalkng®/ NMEA 2000 connections at the same time.
- Do NOT connect the AIS700 to a VHF Radio using NMEA 0183 and SeaTalkng®/ NMEA 2000 connections at the same time.
- Do NOT connect the AIS700 to a PC using NMEA 0183 and USB connections at the same time.
- If you are connecting to an AIS capable VHF Radio, you must disable the VHF Radio's AIS function first. Refer to your Radio's documentation for details on disabling the AIS function.

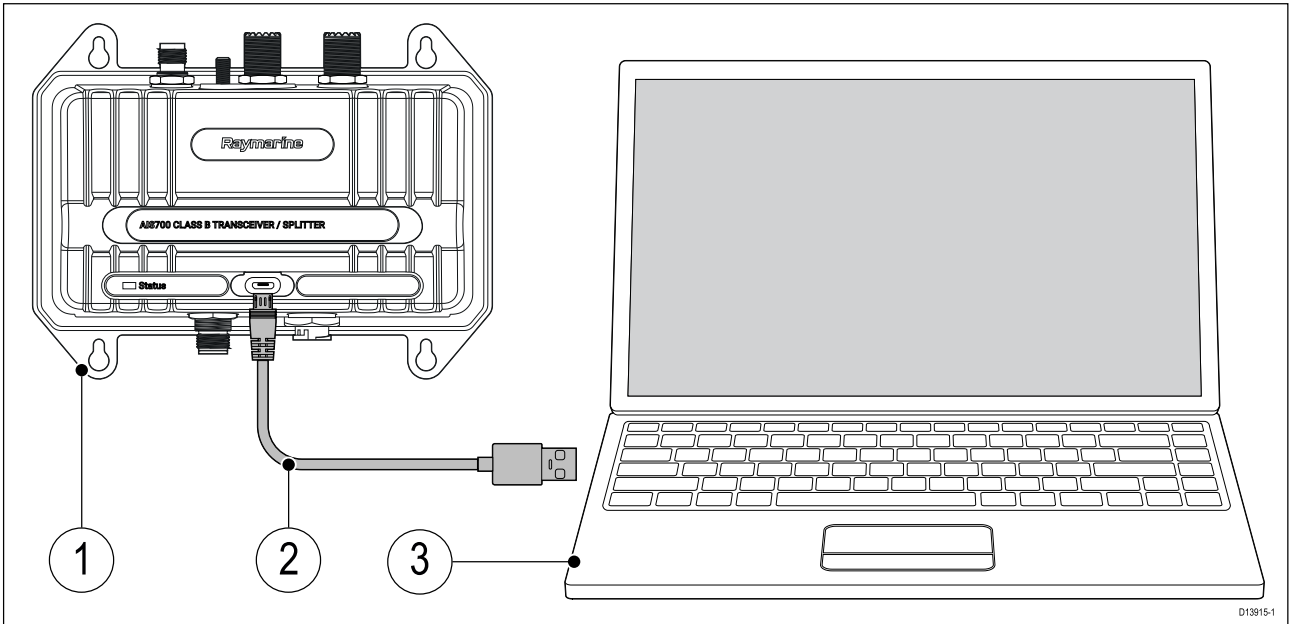
4.2 USB connection

Before using your AIS700 you must configure the unit using the supplied proAIS2 software via a PC connected to the USB connection.

Important:

In the United States of America, it is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user or to otherwise input any inaccurate data in this device. The MMSI and Static Data must be entered only by a Raymarine dealer or other appropriately qualified installer of marine communications equipment on board vessels.

Ensure you check the regulations for your location to ensure you are allowed to configure MMSI data on your unit.



1. AIS700
2. USB Micro-B to type A cable (not supplied)
3. PC (personal computer) running proAIS2

Note:

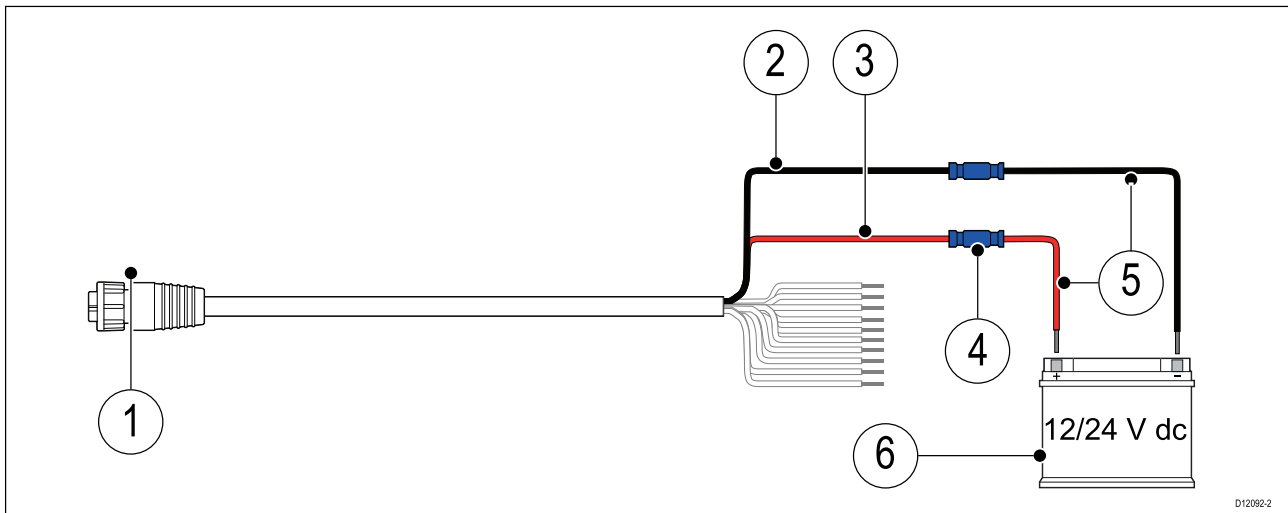
- The PC USB connection will provide power to the unit to enable configuration prior to installation.
- Refer to for details on configuring your AIS700.



Warning: USB device power

Do NOT connect any device to the product's USB connection that requires an external power source.

4.3 Power connection



1. Power/data cable (supplied)
2. Power supply – (Negative) Black wire
3. Power supply + (Positive) Red wire
4. Suitable waterproof connection (not supplied)
5. Power cable extension to vessel's circuit breaker/power source
6. Power source (12/24 V dc)

Note: It is recommended that the power is supplied via a circuit breaker or that the unit is protected using a 3 A inline fuse connected to the Red (+) positive wire.

Power distribution

Recommendations and best practice.

- The product is supplied with a power cable. Only use the power cable supplied with the product. Do NOT use a power cable designed for, or supplied with, a different product.
- Refer to the *Power connection* section for more information on how to identify the wires in your product's power cable, and where to connect them.
- See below for more information on implementation for some common power distribution scenarios.

Important:

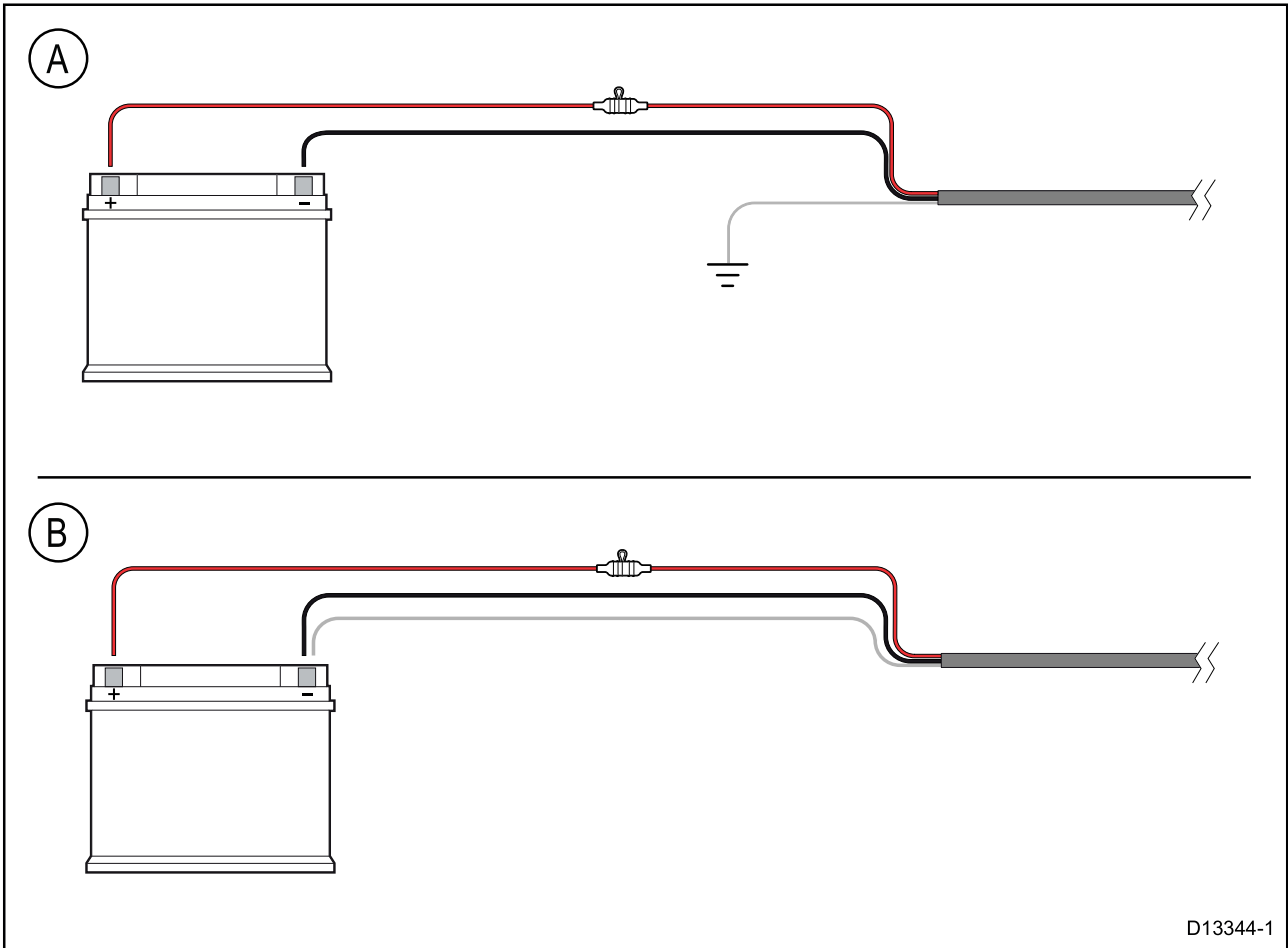
When planning and wiring, take into consideration other products in your system, some of which (e.g. sonar modules) may place large power demand peaks on the vessel's electrical system.

Note:

The information provided below is for guidance only, to help protect your product. It covers common vessel power arrangements, but does NOT cover every scenario. If you are unsure how to provide the correct level of protection, please consult an authorized Raymarine dealer or a suitably qualified professional marine electrician.

Implementation – direct connection to battery

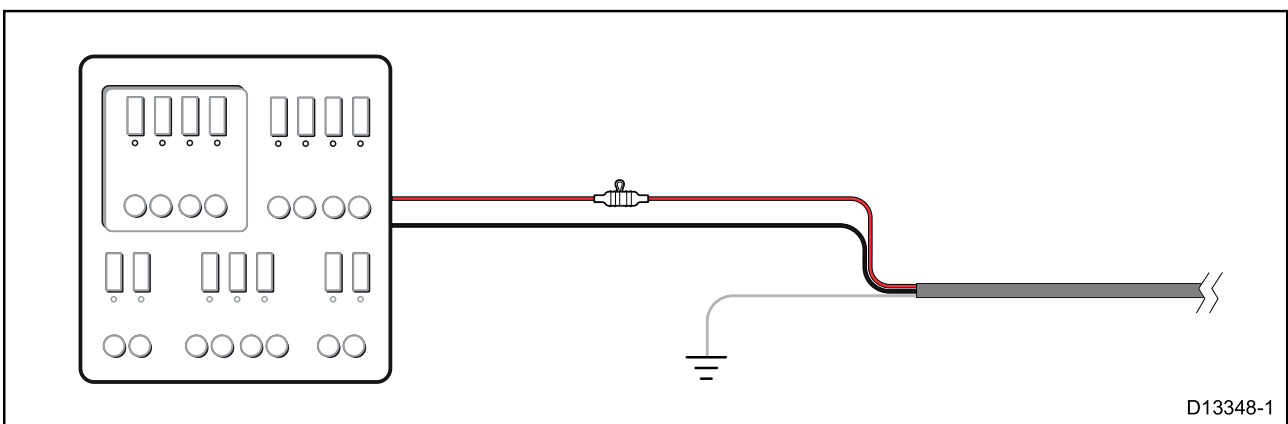
- The power cable supplied with your product may be connected directly to the vessel's battery, via a suitably rated fuse or breaker.
- The power cable supplied with your product may NOT include a separate drain wire. If this is the case, only the power cable's red and black wires need to be connected.
- If the supplied power cable is NOT fitted with an inline fuse, you MUST fit a suitably rated fuse or breaker between the red wire and the battery's positive terminal.
- Refer to the inline fuse ratings provided in the product's documentation.
- If you need to extend the length of the power cable supplied with your product, ensure you observe the dedicated *Power cable extensions* advice provided in the product's documentation.



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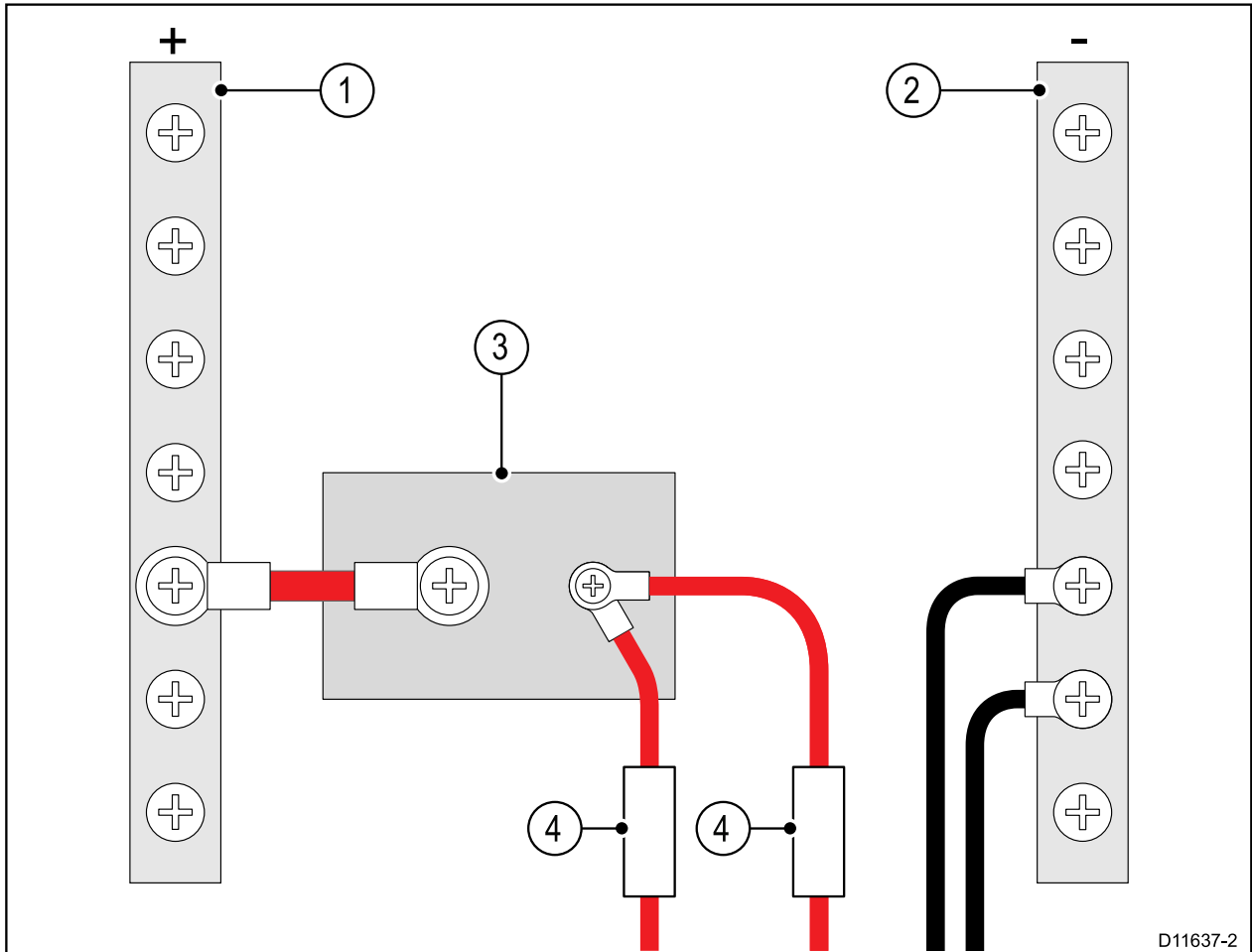
A	Battery connection scenario A: suitable for a vessel with a common RF ground point. In this scenario, if your product's power cable is supplied with a separate drain wire then it should be connected to the vessel's common ground point.
B	Battery connection scenario B: suitable for a vessel without a common grounding point. In this case, if your product's power cable is supplied with a separate drain wire then it should be connected directly to the battery's negative terminal.

Implementation – connection to distribution panel



D13348-1

- Alternatively, the supplied power cable may be connected to a suitable breaker or switch on the vessel's distribution panel or factory-fitted power distribution point.
- The distribution point should be fed from the vessel's primary power source by 8 AWG (8.36 mm²) cable.
- Ideally, all equipment should be wired to individual suitably-rated thermal breakers or fuses, with appropriate circuit protection. Where this is not possible and more than 1 item of equipment shares a breaker, use individual in-line fuses for each power circuit to provide the necessary protection.



D11637-2

1	Positive (+) bar
2	Negative (-) bar
3	Circuit breaker
4	Fuse

- In all cases, observe the recommended breaker / fuse ratings provided in the product's documentation.

Important:

Be aware that the suitable fuse rating for the thermal breaker or fuse is dependent on the number of devices you are connecting.

Power cable extension

If you need to extend the length of the power cable supplied with your product, ensure you observe the following advice:

- The power cable for each unit in your system should be run as a separate, single length of 2-wire cable from the unit to the vessel's battery or distribution panel.
- For power cable extensions, it is recommended that a **minimum** wire gauge of 16 AWG (1.31 mm²). For cable runs longer than 15 meters, you may need to consider a thicker wire gauge (e.g. 14 AWG (2.08 mm²), or 12 AWG (3.31 mm²)).
- An important requirement for all lengths of power cable (including any extension) is to ensure that there is a continuous **minimum** voltage of 10.8 V at the product's power connector, with a fully flat battery at 11 V.

Important: Be aware that some products in your system (such as sonar modules) can create voltage peaks at certain times, which may impact the voltage available to other products during the peaks.

Grounding

Ensure that you observe the separate grounding advice provided in the product's documentation.

More information

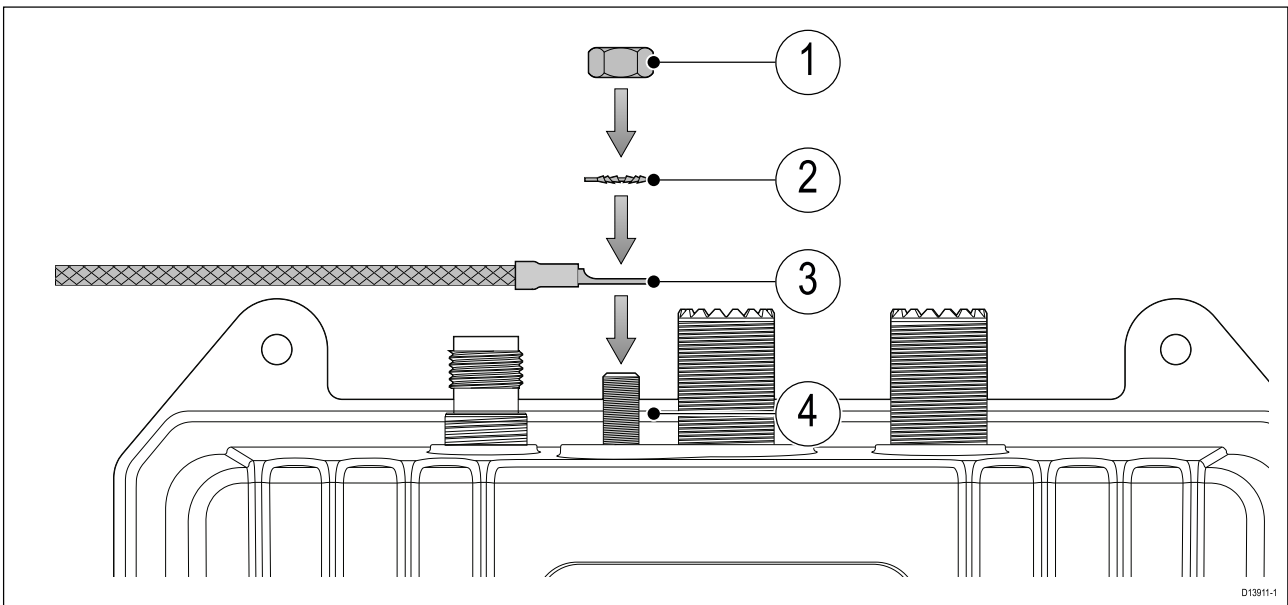
It is recommended that best practice is observed in all vessel electrical installations, as detailed in the following standards:

- BMEA Code of Practice for Electrical and Electronic Installations in Boats
- NMEA 0400 Installation Standard
- ABYC E-11 AC & DC Electrical Systems on Boats
- ABYC A-31 Battery chargers and Inverters
- ABYC TE-4 Lightning Protection

Grounding

The AIS700 includes a dedicated grounding point to reduce potential damage caused by near lightning strikes.

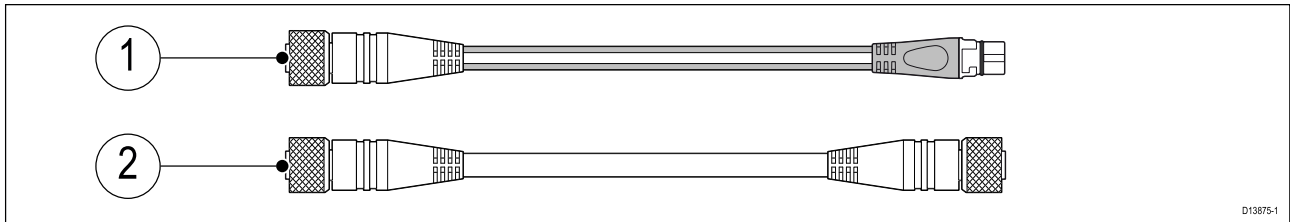
The Grounding point should be connected to your vessel's RF ground. Do NOT connect to any point that is connected to your vessel's 0V Negative battery terminal.



1. M5 Nut (supplied)
2. M5 Shakeproof washer (supplied)
3. Grounding strap connected to vessel RF ground (not supplied)
4. Grounding stud

4.4 NMEA 2000 / SeaTalkng® connection

The AIS700 can transmit data to devices connected on SeaTalkng® or NMEA 2000 CAN bus networks. The AIS700 is connected using the DeviceNet connector located on the bottom of the unit.



1. Use the supplied DeviceNet to SeaTalkng® adaptor cable to connect your AIS700 to an available spur connection on a SeaTalkng® backbone.
2. Alternatively you can connect your AIS700 to a NMEA 2000 backbone using a standard DeviceNet cable (not supplied).

Note:

1. The AIS700 must be connected to a correctly terminated backbone. You cannot connect your AIS700 directly to a MFD.
2. Refer to the instructions supplied with your SeaTalkng® / NMEA 2000 device for details on creating a backbone.

4.5 NMEA 0183 connection

The AIS700 can transmit data to devices connected via NMEA 0183. The AIS700 is connected using the NMEA 0183 wires located on the Power/data cable.

Note: Whilst it is possible to output both AIS and GNSS data, it is NOT recommended that you output GNSS data to external devices as this can cause data conflicts and / or performance issues. The ability to output GNSS data is intended for diagnostics purposes only.

The AIS700 includes 2 bidirectional NMEA 0183 ports. The baud rate for each port can be configured using the supplied proAIS2 software. Both ports can be multiplexed which enables any data provided to one port to be combined with AIS data and output on the other port.

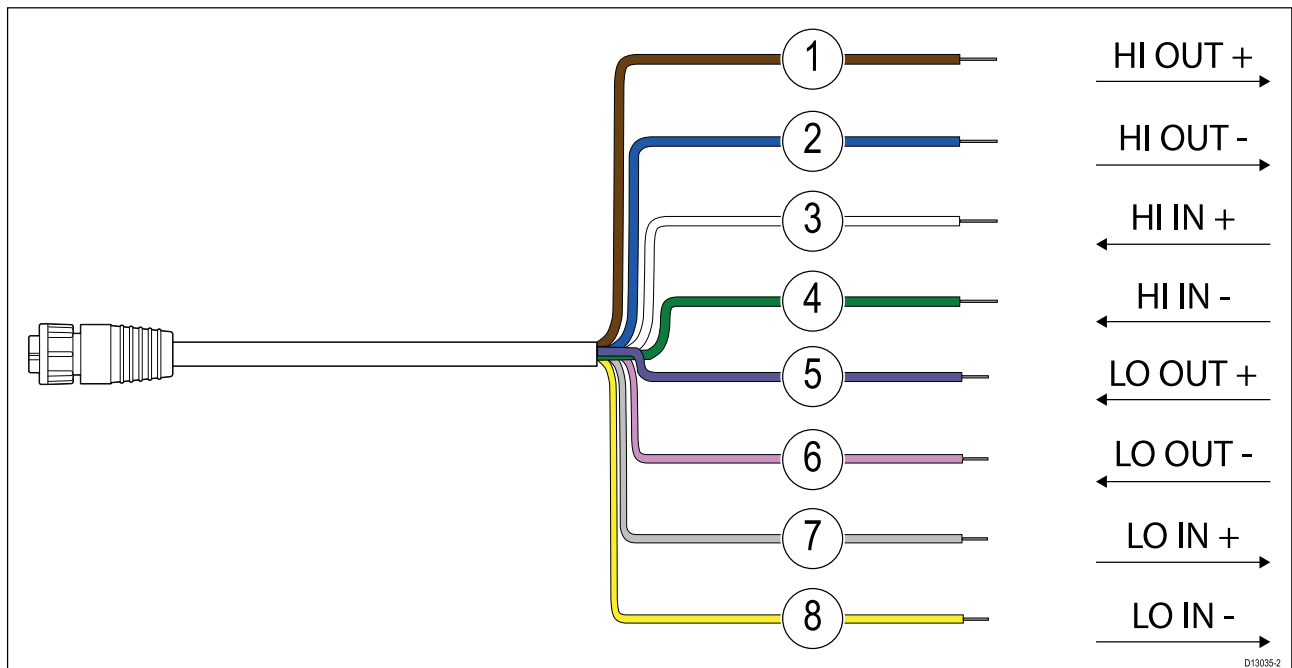
Typically port 1 is connected to an MFD and configured for 38,400 baud rate, the baud rate required for AIS data transfer. Port 2 is connected to a Heading sensor or other NMEA 0183 device and configured for 4,800 baud rate.

Important:

To avoid potential data conflicts or loops multiple network protocols should not be connected to the same device i.e.:

- Do NOT connect the AIS700 to a MFD using NMEA 0183 and SeaTalkng®/ NMEA 2000 connections at the same time.
- Do NOT connect the AIS700 to a VHF Radio using NMEA 0183 and SeaTalkng®/ NMEA 2000 connections at the same time.
- Do NOT connect the AIS700 to a PC using NMEA 0183 and USB connections at the same time.
- If you are connecting to an AIS capable VHF Radio, you must disable the VHF Radio's AIS function first. Refer to your Radio's documentation for details on disabling the AIS function.

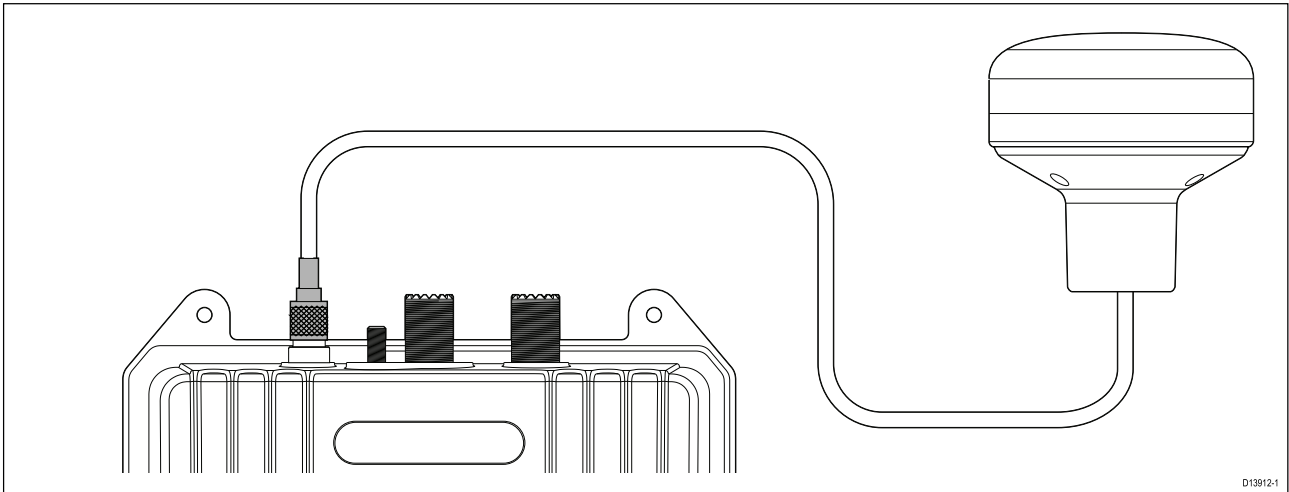
The NMEA 0183 connection wires on the power/data cable are identified below.



1	Brown (HI OUT +)	2	Blue (HI OUT -)
3	White (HI IN +)	4	Green (HI IN -)
5	Purple (LO OUT +)	6	Pink (LO OUT -)
7	Gray (LO IN +)	8	Yellow (LO IN -)

4.6 GPS (GNSS) antenna connection

Connect the supplied GNSS antenna to your AIS700 using the GNSS antenna connection. The antenna is fitted with a 10m (33ft) cable for connecting to the AIS700.

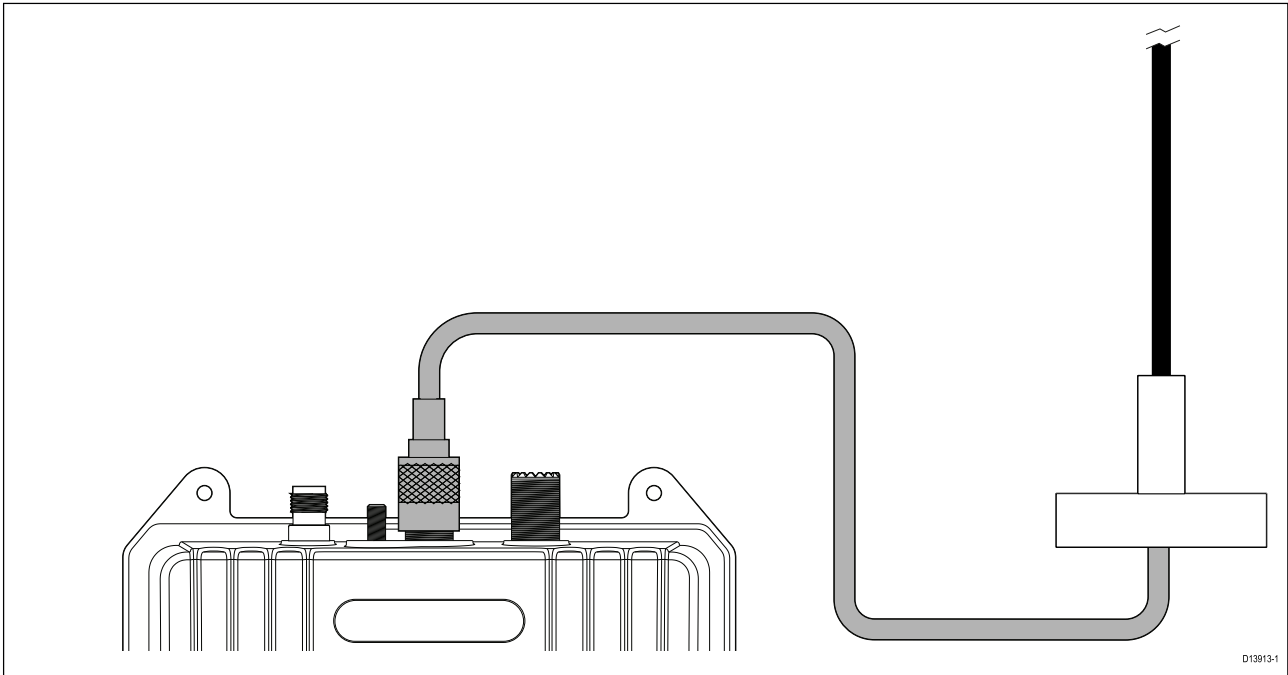


Note: Do NOT connect any other antenna than the one supplied with your AIS700.

If the antenna is not connected or connected incorrectly then your AIS700 will operate in Silent mode, the AIS700 will not transmit but will still receive.

4.7 VHF antenna connection

Connect a VHF antenna (not supplied) to your AIS700 using the VHF antenna connection.



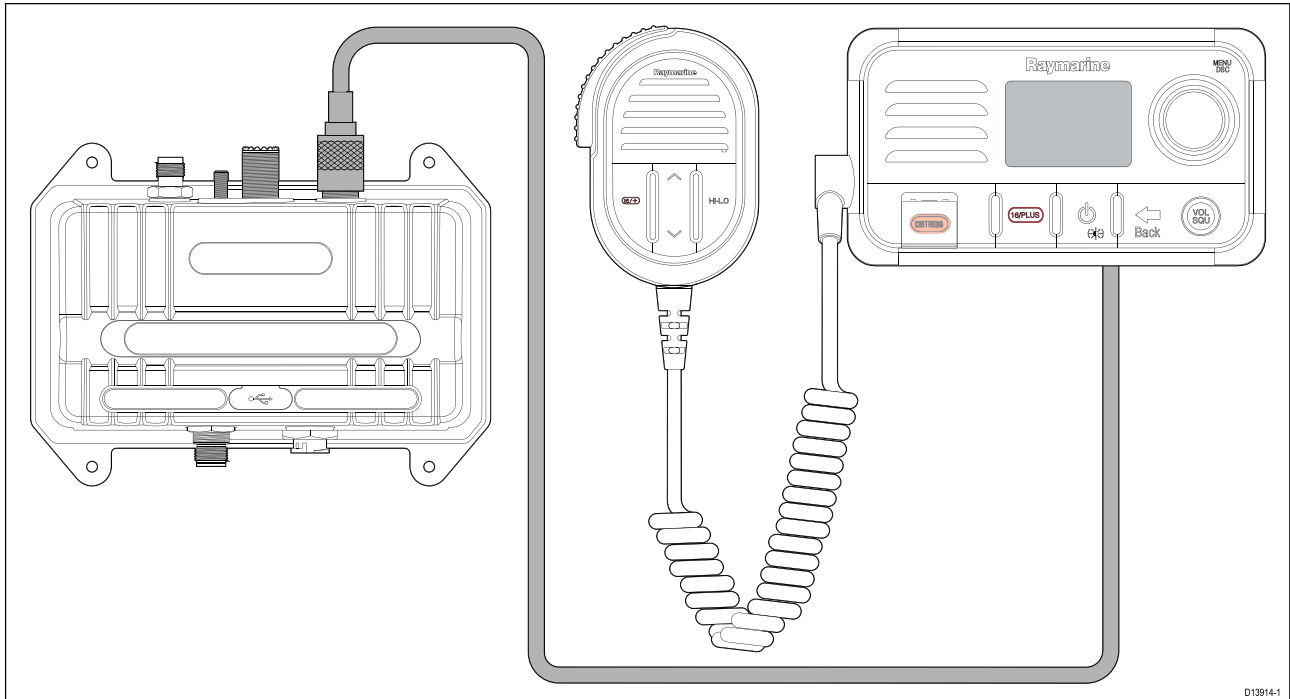
VHF antenna requirements

The VHF antenna should meet the following requirements:

Frequency band	156.025 MHz to 162.025 MHz
VSWR (Voltage Standing Wave Ratio)	should not exceed 2:1
Impedance	50 Ohm
Gain	3dBi Max
Connector	PL-259

4.8 VHF radio connection

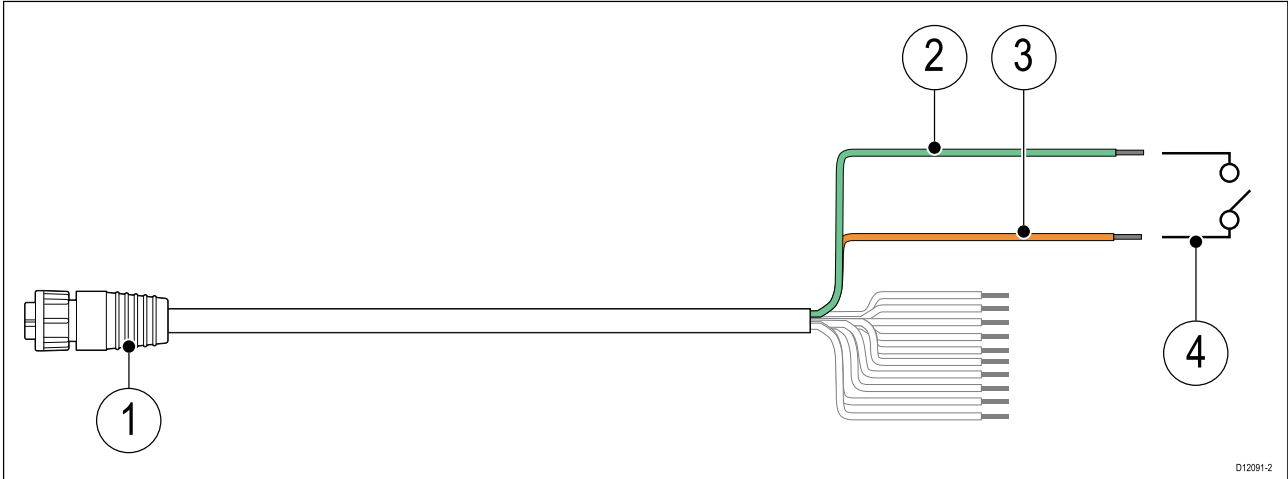
For systems that include a VHF DSC radio you can share the VHF antenna by connecting your Radio's VHF antenna connection to the VHF Radio connection on your AIS700 and then connecting your VHF antenna to the AIS700,s VHF antenna connection.



4.9 Silent mode switch connection

In Silent mode your AIS700 will stop transmitting position data and operate as a receiver only. Silent mode can be enabled using a connected MFD and by connecting a switch to the relevant wires on the Power/data cable. Please refer to your MFD's operation instructions for details on enabling silent mode.

Note: A silent mode switch will override an MFD's Silent mode setting.



1. Power/data cable (supplied)
2. Light Green wire
3. Orange wire
4. Switch (not supplied)

Crimp or solder wire connections and ensure suitable insulation from water ingress.

Chapter 5: Set up

Chapter contents

- [5.1 Configure before use on page 40](#)
- [5.2 Obtain MMSI \(Maritime Mobile Service Identity\) number on page 41](#)
- [5.3 Configuration on page 42](#)
- [5.4 Software updates on page 44](#)

5.1 Configure before use

Before use this product must be correctly configured using a personal computer and the supplied proAIS2 software. Incorrect configuration can cause erroneous data and prevent your product from transmitting.

5.2 Obtain MMSI (Maritime Mobile Service Identity) number

Before commencing installation ensure you have obtained a MMSI number for your vessel.

A MMSI is a 9 digit number which is sent over a radio frequency channel in order to identify the originating vessel/station. If your vessel already has a MMSI number (used for a VHF DSC radio) then the same MMSI number must be used to program your AIS700.

Note:

If a MMSI number is not entered, the AIS700 can only be used in Silent Mode and will operate as a receiver only.

In the United States of America, the MMSI and Static Data must be entered only by a Raymarine® dealer or other appropriately qualified installer of marine communications equipment on board vessels.

The user is NOT authorized to do this.

In some areas, a radio operator licence is required before a MMSI number will be issued. You can request a MMSI number from same agency that issues radio or Ship Radio licences in your area.

In Europe and other parts of the world outside of the United States of America, the MMSI and Static data can be set up by the user.

For further details, refer to the relevant Telecommunications Regulatory Body for your area.

Refer to [Appendix A MMSI Regulatory bodies and application submissions](#)

for a list of contacts for obtaining MMSI numbers for some areas.



Warning: MMSI entry

You can only enter a MMSI number once, if you enter the number incorrectly or need to change your MMSI number, the unit will require re-programming by an authorized Raymarine® dealer.

5.3 Configuration

The AIS700 can be configured before or after installation using a personal computer, USB Micro-B cable and the supplied proAIS2 software.

The manner in which configuration is carried out depends on the legal requirements of your geographical location.

USA

In the USA, it is a legal requirement that the configuration is performed by a suitable dealer.

You can use the supplied proAIS2 PC software, to check the vessel data programmed into your AIS700. If this information is incorrect please contact your Raymarine dealer.

Areas outside of USA

In areas outside of the USA, use the supplied proAIS2 PC software to configure your AIS700.

Note: If configuring after installation ensure any MFDs on the same network are switched off first, otherwise you will not be able to correctly configure your AIS700.

The following vessel related static data should be configured:

- MMSI number
- Vessel name
- Vessel call sign
- Vessel dimensions including AIS GNSS antenna location
- Vessel type

A valid 9 digit MMSI number must be entered. Invalid numbers will not be accepted. All other fields (i.e. vessel type, name etc.) are optional.

Installing proAIS2 and USB drivers

Before connecting the AIS unit to a PC the proAIS2 application and USB drivers must be installed. To install follow the steps below:

1. Insert the supplied CDROM and navigate to the proAIS2 folder.

If you do not have an optical media drive such as a CDROM then the proAIS2 software can also be downloaded from the Raymarine® website: www.raymarine.com/software

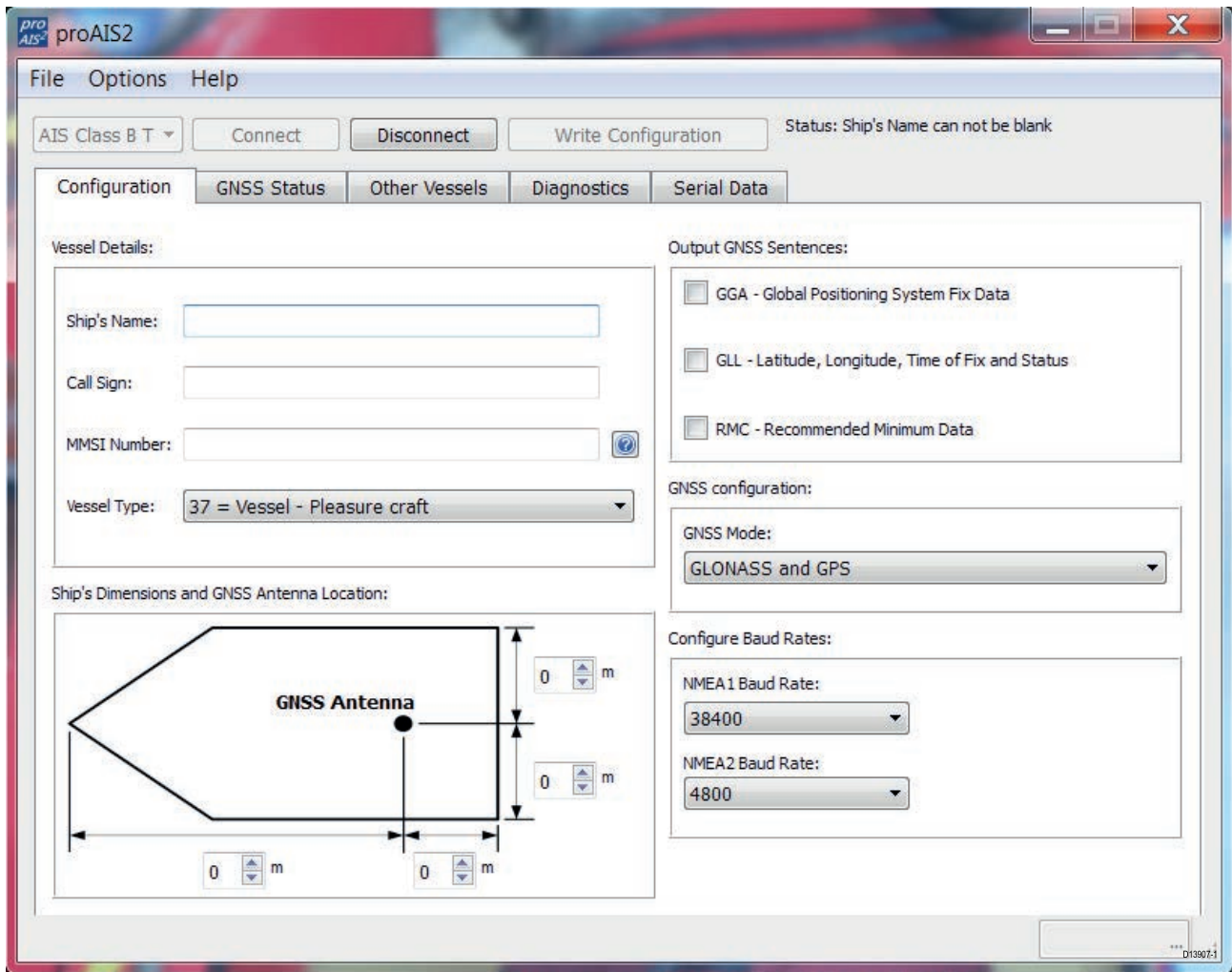
2. Double click on the setup.exe file to launch the installer.
3. Follow the on screen installation instructions, ensuring that the option to install USB drivers is selected when presented.
4. Once installed the AIS unit can be connected to the PC. The USB drivers will be installed automatically and the AIS unit will appear as a new COM port device.
5. Launch proAIS2 by navigating to the proAIS2 folder accessible from the start menu.
6. The proAIS2 user manual is available from the help menu from within the application.

Configuring using proAIS2

Important:

In the United States of America, it is a violation of the rules of the Federal Communications Commission to input an MMSI that has not been properly assigned to the end user or to otherwise input any inaccurate data in this device. The MMSI and Static Data must be entered only by a Raymarine dealer or other appropriately qualified installer of marine communications equipment on board vessels.

Ensure you check the regulations for your location to ensure you are allowed to configure MMSI data on your unit.



With the proAIS2 software open on your PC:

1. Select the AIS device from the drop down list at the top of the page.
2. Click **Connect**.
3. Enter your vessel's details, including MMSI in the relevant fields.
4. Select a **Vessel Type** appropriate for your vessel from the drop down list.
5. Ensure that the built-in GNSS receiver is not outputting sentences (i.e. ensure GGA, GLL and RMC boxes are not ticked).

The GNSS receiver built-in to the AIS700 is intended to provide GNSS data to the AIS unit only, outputting this data can cause data conflicts. The ability to output these sentences is intended for diagnostics purposes only.

6. Enter your vessel's dimensions and GNSS antenna location in the relevant fields.
7. If required set the baud rate for your NMEA 0183 ports.
8. Click **Write Configuration** to save your configuration settings.
9. Click **Disconnect**.

5.4 Software updates

You can update the software on the AIS700 using a Raymarine MFD running LightHouse™ 2 or LightHouse™ 3 operating system connected using SeaTalkng® or NMEA 2000.

Please refer to the operation instructions for your MFD / operating system for details on how to perform a software update.

Note:

You can also perform software updates using a PC and the USB connection, please refer to the Raymarine® website for software and instructions: www.raymarine.com/software





Chapter 6: Troubleshooting

Chapter contents

- [6.1 LED Status indicator on page 46](#)
- [6.2 Troubleshooting on page 47](#)

6.1 LED Status indicator

The LED status indicator on the transceiver provides an indication of product status.

LED	Color	Status
	Green	Transceiver is operating normally and has transmitted at least 1 position report.
	Amber	Transceiver is not transmitting. <ul style="list-style-type: none"> • Wait at least 30 minutes to check that a 'Quiet time' has not been requested by the local authority.
	Red	Transceiver fault. <ul style="list-style-type: none"> • Check MMSI number and static data has been correctly configured. • Check GNSS antenna is properly connected and has a clear unobstructed view of the sky. • Check the VHF antenna is properly connected and is not short circuiting to the vessel structure. • Check that power supply is at the correct voltage (12 V dc or 24 V dc). • Excessive difference between Heading from an input device and COG.
	Blue	Transceiver is running in silent mode (not transmitting), if you want to disable silent mode: <ul style="list-style-type: none"> • Check the AIS Silent mode setting on your MFD. • Check the position of the dedicated Silent mode switch, if fitted (The switch will override the MFD setting). • Where no dedicated switch is fitted, check that the Light Green and Orange wires on the Power/data cable are not shorting together.

6.2 Troubleshooting

Problem	Action required
No power	<ul style="list-style-type: none"> • Check the power supply is properly connected. • Check the power supply voltage is correct (12 V dc or 24 V dc) • Check relevant fuses have not blown or circuit breaker has not tripped.
AIS configuration, static data is not being saved.	<ul style="list-style-type: none"> • Switch off all associated MFDs, then retry configuration. • Disconnect all connections then connect only the USB cable to a PC and retry configuration.
AIS hardware not detected by MFD (No AIS symbol shown on Homescreen)	<ul style="list-style-type: none"> • Check SeaTalkng[®] / NMEA 2000 or NMEA 0183 connection and ensure proper connection. • When connected using NMEA 0183 ensure the port used to connect your transceiver to your MFD is set to 38,400 baud rate. • Ensure the MFD is either; connected directly to the same CAN bus network as your AIS transceiver, or the same SeaTalkhs[®] network as the MFD that is connected to the same CAN bus as your transceiver.
No AIS targets/data shown on MFD (AIS symbol shown on Homescreen)	<ul style="list-style-type: none"> • Check MMSI number and static data has been correctly configured. • Check the VHF antenna is properly connected and is not short circuiting to the vessel structure. • When connected using NMEA 0183 ensure the port used to connect your transceiver to your MFD is set to 38,400 baud rate. • AIS Layer not enabled on MFD. • MFD set to display Dangerous or Buddy targets only and none are in range of your vessel. • No AIS equipped vessels in range.
Erratic or conflicting data	<ul style="list-style-type: none"> • More than 1 AIS unit is connected and operating. • NMEA 0183 and SeaTalkng[®] / NMEA 2000 connected at the same time.

Chapter 7: Technical specification

Chapter contents

- [7.1 AIS700 technical specification on page 50](#)

7.1 AIS700 technical specification

Power specification

Supply voltage	12 V dc / 24 V dc
Operating voltage range	9.6 V dc to 31.2 V dc
Power consumption	<3 W
Fuse rating	3 A
LEN (Load Equivalency Number)	1

Environmental specification

Operating temperature range	-15°C to +55°C (+5°F to +131°F)
Storage temperature range	-20°C to +75°C (-4°F to 167°F)
Humidity	93% at 40°C
Waterproofing	IPx6, IPx7

AIS specification

Transmitter	x 1
Receiver	x 2
Operating frequency range	<ul style="list-style-type: none"> • Transmitting: 156.0MHz to 162.025 MHz • Receiving: 156.0MHz to 174.0 MHz
Channel spacing	25 KHz
AIS performance	5 W SOTDMA

GNSS receiver specification

Channels	72
Cold start acquisition	26s nominal
Position source	<ul style="list-style-type: none"> • GPS • GLONASS

External connections

VHF antenna connector type	SO-239 co-axial
VHF radio connector type	SO-239 co-axial
GNSS antenna connector type	50Ω TNC co-axial
SeaTalkng [®] / NMEA 2000 connector type	5 way DeviceNet male
Power and NMEA 0183	12 way bare ended wires
NMEA 0183 port 1 (MFD connection)	NMEA 0183 HS (IEC 61162–1) compliant, bi-directional, RS422 levels, 4 wire interface (differential signalling), configurable baud rate
NMEA 0183 port 2 (Instrument connection)	NMEA 0183 (IEC 61162–1) compliant, bi-directional, RS422 levels, 4 wire interface (differential signalling), configurable baud rate
Power	2 way bare ended wires
Silent mode switch	2 way bare ended wires
USB	Micro-B
Earth stud	Threaded stud (nut and washer supplied)

Chapter 8: Technical support

Chapter contents

- 8.1 Raymarine product support and servicing on page 52
- 8.2 Learning resources on page 54

Chapter 9: Spares and accessories

Chapter contents

- [9.1 Spares and accessories on page 56](#)
- [9.2 SeaTalk^{ng}® cables and accessories on page 57](#)

9.1 Spares and accessories

The following spares are available:

Part number	Description
R62241	GNSS passive antenna with 10 m (32.8 ft) coaxial cable (for AIS transceivers only)
R32162	2 m (6.56 ft) Power/data cable

9.2 SeaTalk^{ng}® cables and accessories

SeaTalk^{ng} cables and accessories for use with compatible products.

Part No	Description	Notes
T70134	SeaTalk ^{ng} starter kit	Includes: <ul style="list-style-type: none"> • 1 x 5 Way connector (A06064) • 2 x Backbone terminator (A06031) • 1 x 3 m (9.8 ft) spur cable (A06040) • 1 x Power cable (A06049)
A25062	SeaTalk ^{ng} Backbone Kit	Includes: <ul style="list-style-type: none"> • 2 x 5 m (16.4 ft) Backbone cable (A06036) • 1 x 20 m (65.6 ft) Backbone cable (A06037) • 4 x T-piece (A06028) • 2 x Backbone terminator (A06031) • 1 x Power cable (A06049)
A06038	SeaTalk ^{ng} 0.4 m (1.3 ft) spur	
A06039	SeaTalk ^{ng} 1 m (3.3 ft) spur	
A06040	SeaTalk ^{ng} 3 m (9.8 ft) spur	
A06041	SeaTalk ^{ng} 5 m (16.4 ft) spur	
A06042	SeaTalk ^{ng} 0.4 m (1.3 ft) elbow spur	
A06033	SeaTalk ^{ng} 0.4 m (1.3 ft) backbone	
A06034	SeaTalk ^{ng} 1 m (3.3 ft) backbone	
A06035	SeaTalk ^{ng} 3 m (9.8 ft) backbone	
A06036	SeaTalk ^{ng} 5 m (16.4 ft) backbone	
A06068	SeaTalk ^{ng} 9 m (29.5 ft) backbone	
A06037	SeaTalk ^{ng} 20 m (65.6 ft) backbone	
A06043	SeaTalk ^{ng} to bare ends 1 m (3.3 ft) spur	
A06044	SeaTalk ^{ng} to bare ends 3 m (9.8 ft) spur	
A06049	SeaTalk ^{ng} Power cable	
A06031	SeaTalk ^{ng} Terminator	
A06028	SeaTalk ^{ng} T-piece	Provides 1 x spur connection
A06064	SeaTalk ^{ng} 5-way connector	Provides 3 x spur connections
A06030	SeaTalk ^{ng} backbone extender	
E22158	SeaTalk to SeaTalk ^{ng} converter kit	Allows the connection of SeaTalk devices to a SeaTalk ^{ng} system.
A80001	SeaTalk ^{ng} Inline terminator	Provides direct connection of a spur cable to the end of a backbone cable. No T-piece required.

Part No	Description	Notes
A06032	SeaTalk ^{ng} Blanking plug	
R12112	ACU / SPX SeaTalk ^{ng} spur cable 0.3 m (1.0 ft)	Connects an SPX course computer or an ACU to a SeaTalk ^{ng} backbone.
A06047	SeaTalk (3 pin) to SeaTalk ^{ng} adaptor cable 0.4 m (1.3 ft)	
A22164	SeaTalk to SeaTalk ^{ng} spur 1 m (3.3 ft) spur	
A06048	SeaTalk2 (5 pin) to SeaTalk ^{ng} adaptor cable 0.4 m (1.3 ft)	
A06045	DeviceNet adaptor cable (Female)	Allows the connection of NMEA 2000 devices to a SeaTalk ^{ng} system.
A06046	DeviceNet adaptor cable (Male)	Allows the connection of NMEA 2000 devices to a SeaTalk ^{ng} system.
E05026	DeviceNet adaptor cable (Female) to bare ends.	Allows the connection of NMEA 2000 devices to a SeaTalk ^{ng} system.
E05027	DeviceNet adaptor cable (Male) to bare ends.	Allows the connection of NMEA 2000 devices to a SeaTalk ^{ng} system.

Appendix B NMEA 0183 supported sentences

The AIS700 supports the following NMEA 0183 sentences

Sentence	Description	Transmit	Receive
ABK	ABM/BBM acknowledgement	•	
ABM	Addressed binary message		•
ACA	AIS channel management assignment	•	
ACS	AIS channel management information source	•	
AIQ	AIS query		•
ACK	Acknowledge alarm		•
BBM	Broadcast binary message		•
HDT	Heading true		•
RST	Equipment reset command	•	•
SSD	Ship static data		•
THS	True heading and status		•
TXT	Text	•	
VDM	AIS VHF data-link message	•	
VDO	AIS VHF data-link own-vessel report	•	
VSD	Voyage static data		•

Sentences output by query (AIQ)

Sentence	Description
ACA	AIS channel management assignment
SSD	Ship static data
TXT	Text
VER	Version
VSD	Voyage static data

Appendix C NMEA 2000 supported PGNs

The AIS700 supports the following PGNs.

PGN	Description	Transmit	Receive
59392	ISO Acknowledgement	•	•
59904	ISO Request	•	•
60928	ISO Address Claim	•	•
65240	ISO Commanded Address	•	•
126208	Request group function	•	•
126992	System time	•	
126993	Heartbeat	•	
126996	Product information	•	•
127250	Vessel heading		•
129025	Position, rapid update	•	
129026	COG & SOG, rapid update	•	
129029	GNSS position data	•	
129038	AIS Class A position report	•	
129039	AIS Class B position report	•	
129040	AIS Class B extended position report	•	
129041	AIS AToN report	•	
129793	AIS UTC and date report	•	
129794	AIS class A static and voyage related data	•	
129795	AIS addressed binary message	•	
129796	AIS Acknowledge	•	
129797	AIS binary broadcast message	•	
129798	AIS SAR aircraft position report	•	
129801	AIS addressed SRM	•	
129802	AIS safety broadcast binary message	•	
129809	AIS class B CS static data report part A	•	
129810	AIS class B CS static data report part B	•	

Appendix D AIS overview

Your AIS700 uses digital radio signals to exchange 'real-time' information between vessels, shore based stations, or aids to navigation (AToNs) on dedicated VHF frequencies. This information is used to identify and track vessels in the surrounding area and to provide fast, automatic and accurate collision avoidance data. Although AIS augments your Radar app by operating in Radar blind spots and detecting smaller AIS-fitted vessels, it does not replace your Radar, as it relies on receiving transmitted AIS information and therefore cannot detect objects such as landmasses, navigational beacons or vessels not equipped with AIS.

Note:

NEVER assume that AIS is displaying information from all vessels in the area, because:

- Not all vessels are fitted with AIS
- Although it is mandatory for larger commercial vessels to carry AIS, it is not mandatory to use it.

AIS should be used only to augment Radar information, not substitute it.

AIS limitation

Never assume that your AIS is detecting all vessels in the area. Always exercise due prudence and do not use AIS as a substitute for sound navigational judgement.

Classes of AIS

Class A transceivers

Class A AIS transceivers transmit and receive AIS signals. AIS transceivers are currently mandatory on all commercial vessels exceeding 300 tons that travel internationally (SOLAS vessels).

The following information can be transmitted by a Class A AIS system:

- Static data (Includes information such as MMSI number, vessel name, vessel type, call sign, IMO number, length, beam and GNSS antenna location).
- Voyage related data (Includes information such as draft, cargo, destination, ETA and other relevant information).
- Dynamic data (Includes information such as time (UTC), ship's position, COG, SOG, heading, rate of turn and navigational status).
- Dynamic reports (Ship's speed and status).
- Messages (Alarms and safety messages).

Remember that not all vessels will transmit all of the information.

Class B transceivers

Class B AIS transceivers transmit and receive AIS signals, but use a reduced set of data compared to Class A (see *Data Summary*). A Class B AIS transceiver can be fitted on any vessel not fitted with a Class A transceiver, but is not mandatory aboard any vessel.

Data Summary

Data	Receiver (receive)	Transceiver (transmit)	Transceiver (receive)
Ship's name	Yes	Yes	Yes
Type	Yes	Yes	Yes
Call sign	Yes	Yes	Yes
IMO number	Yes	No	Yes
Length and beam	Yes	Yes	Yes
Antenna location	Yes	Yes	Yes
Draft	Yes	No	Yes
Cargo Information	Yes	Yes	Yes
Destination	Yes	No	Yes
ETA	Yes	No	Yes
Time	Yes	Yes	Yes
Ship's position	Yes	Yes	Yes
COG	Yes	Yes	Yes

Data	Receiver (receive)	Transceiver (transmit)	Transceiver (receive)
SOG	Yes	Yes	Yes
Gyro heading	Yes	Yes*	Yes
Rate of turn	Yes	No	Yes
Navigational status	Yes	No	Yes
Safety message	Yes	No	Yes

*Class B transceivers do not transmit a Gyro heading unless the transceiver is receiving an NMEA HDT sentence from an external source.

Data reporting intervals

AIS information is classed as either static or dynamic. Static information is broadcast, when data has been amended, or upon request, or by default, every 6 minutes.

The reporting rates for dynamic information depend on speed and course change, and are given in the following tables.

Note: The reporting rates shown here are for reference and may not be the rate at which information is actually received by your AIS transceiver. This is dependent on a number of factors, including but not limited to antenna height, gain and signal interference.

Class A systems

Ships Dynamic Conditions	Reporting rate	
	Not changing course	Changing course
At anchor or moored, moving less than 3 knots	3 Minutes	3 Minutes
At anchor or moored, moving greater than 3 knots	10 Seconds	10 Seconds
0-14 knots	10 Seconds	3 1/3 Seconds
14-23 knots	6 Seconds	2 Seconds
Faster than 23 knots	2 Seconds	2 Seconds

Class B systems

Ships Dynamic Conditions	Reporting rate (nominal)
SOTMDA – 0 to 2 knots	3 Minutes
SOTMDA – 2 to 14 knots	30 Seconds
SOTMDA – 14 to 23 knots	15 Seconds
SOTMDA – Greater than 23 knots	5 Seconds
CSTMDA – 0 to 2 knots	3 Minutes
CSTMDA – Greater than 2 knots	30 Seconds

Other AIS sources

Source	Reporting rate
Search and Rescue (SAR) aircraft	10 Seconds
Aids to navigation (AToN)	3 Minutes
AIS base station	10 Seconds or 3.33 Seconds, depending on operating parameters

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